

CLAIMS

- 1 1. A method of completing a subterranean well comprising the steps of:
 - 2 a. assembling a production tube string having at least one side pocket
 - 3 mandrel;
 - 4 b. positioning said tube string within a well bore;
 - 5 c. displacing cement through said tube string and side pocket mandrel
 - 6 into the well bore annulus around said tube string; and,
 - 7 d. substantially removing residual cement from within said side pocket
 - 8 mandrel by well working fluid.
- 1 2. A method of completing a subterranean well as described by claim 1
2 wherein said residual cement is substantially removed by well working
3 fluid.
- 1 3. A method of completing a subterranean well as described by claim 2
2 wherein said well working fluid displaces a cement wiper plug through said
3 mandrel to remove a first portion of cement within said mandrel.
- 1 4. A method of completing a subterranean well as described by claim 3
2 wherein well working fluid displacing said wiper plug turbulently flushes
3 additional cement from within said mandrel.
- 1 5. A side pocket mandrel comprising:
 - 2 a. an axially elongated tube terminated at distal ends by asymmetric
 - 3 assembly joints;
 - 4 b. an asymmetric flow channel along an inner volume of said tube
 - 5 between said assembly joints;
 - 6 c. a cylinder bore enclosure within said inner volume, lateral of said
 - 7 flow channel and between said assembly joints, said cylinder bore

8 enclosure having a length that is less than half the length of said
9 tube inner volume;
10 d. a normally unoccupied channel of workspace within said inner
11 volume extending from said cylinder bore toward a proximate
12 assembly joint; and,
13 e. an unclaimed portion of said inner volume beyond said flow
14 channel, said cylinder bore enclosure and said workspace channel
15 being substantially occupied by filler material.

1 6. A side pocket mandrel as described by claim 5 wherein said filler material
2 comprises surface discontinuities formed to induce fluid flow turbulence.

1 7. A side pocket mandrel as described by claim 6 wherein said surface
2 discontinuities comprise surface upsets.

1 8. A side pocket mandrel as described by claim 6 wherein said surface
2 discontinuities comprise transverse jet channels.

1 9. A side pocket mandrel as described by claim 5 wherein said filler material
2 comprises a plurality of independent increments.

1 10. A side pocket mandrel as described by claim 9 wherein each of said
2 independent increments of filler material is separated from adjacent
3 increments.

1 11. A side pocket mandrel as described by claim 9 wherein each of said
2 independent increments of filler material is welded to a tube wall enclosing
3 said inner volume.

- 1 12. A side pocket mandrel as described by claim 9 wherein said filler material
2 is aligned in substantially parallel rows on opposite sides of said
3 workspace channel.
- 1 13. A well tubing wiper plug comprising:
2 a. a leading bore wiper unit secured to an assembly shaft;
3 b. a trailing bore wiper unit secured to said assembly shaft at a
4 position separated from said trailing unit by a distance substantially
5 corresponding to the length of a tubing joint; and,
6 c. a bore centralizing unit secured to said assembly shaft between
7 said leading and trailing bore wiper units.
- 1 14. A well tubing wiper plug as described by claim 13 wherein said wiper units
2 comprise a serial plurality of pliant material discs.